APPENDIX B

SPLICING TECHNIQUE

B-1. General. Splices should be avoided if at all possible. They are sources of deterioration, error, and additional work in the installation of any electrical work. To avoid their use, the meters should be purchased with adequate lengths of cable attached at the factory by the manufacturer. This method is faster and takes advantage of the laboratory like conditions that are available for attaching cable to meters at the factory.

B-2. Personnel. Splicing should be done by experienced instrumentation personnel who are familiar with the instruments to which the wires are to be spliced. Since the splice is generally to be embedded in concrete, it must be done correctly the first time and done in a manner that will last the lifetime of the structure. For these reasons it is recommended that experienced instrumentation personnel perform the splice.

B-3. Splicing Operation. Making the splice to attach the added cable lead to the instrument is an important and exacting operation, but not necessarily complicated or difficult. In making a splice three primary objectives must be achieved; first, the individual conductors must be properly matched and securely connected to insure proper functioning of the electrical circuits; second, the soldered connection of individual conductors must not deteriorate chemically during the life of the embedded instrument; and third, the splice must be moisture-proof. The aluminum pipe splice is considered the most satisfactory method for producing permanently moisture-proof splices. In order to realize the objectives stated above, the following step-by-step procedures should be observed. To accomplish the desired results, the materials and working conditions must be clean, since dust, dirt, oil, or grease on the splicing components will likely prevent proper electrical connections.

Step 1. Remove the cable sheath on the lead to be added and on the lead attached to the instrument for 4 in. and stagger the individual conductors by l-in. lengths as shown in view 1 on Figure B-l so that the finished conductor splices will not overlap. In removing the sheath take care not to cut or otherwise damage the insulation on the conductors.

Step 2. Slip a Pyle-National cord and Cable Grip assembly over the lead coming from the instrument, and an identical assembly along with a piece of threaded aluminum pipe over the other lead of the cable. The aluminum pipe should be of sufficient length and diameter to house the entire wrapped splice and the Pyle-National Cord and Cable Grip should be sized with a grommet to fit the cable and have diameter and threading to fit the aluminum pipe. This connector assembly is available from Pyle-National Company, 1334 North Kostner Avenue, Chicago, Illinois 60651.

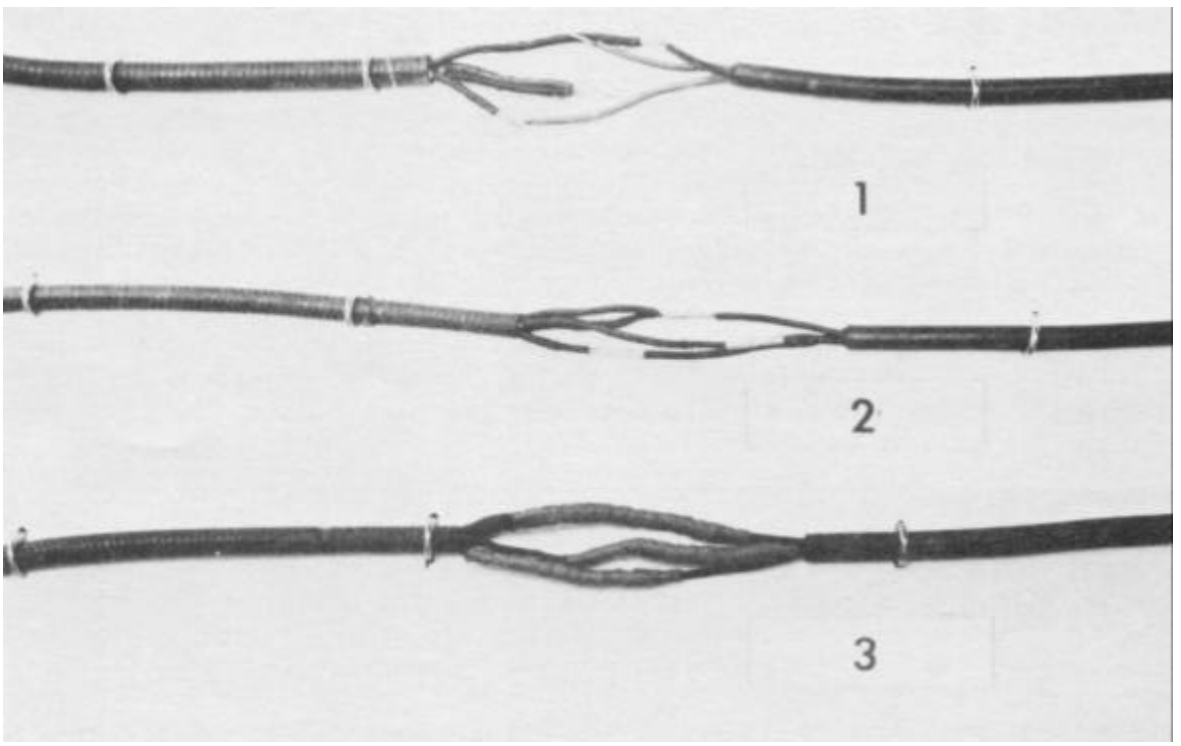

Figure B-l. Interior Stages of Splice. (Photo by WES)

Step 3. Strip 1/2 in. of insulation from each conductor, taking care not to cut any of the strands or otherwise damage the conductors.

Step 4. Tin the stripped ends of each conductor by dipping melted solder using a rosin flux. Because of subsequent corrosive effects, acid-fluxed solder must not be used.

Step 5. Connect the conductors by sweating on telephone connectors or soldering sleeves as in view 2 of Figure B-1.

Step 6. Wash soldered splices thoroughly with 1, 1, 1-trichloroethane.

Step 7. Coat the individual conductors (exposed insulation and splice) with Joy Manufacturing Co. No. 319756-3 bonding cement, available from Joy Manufacturing Co., Route 4, Box 156, La Grange, North Carolina 28551.

Step 8. After the cement has become tacky, wrap each individual conductor with a single layer of half-lapped prevulcanized gray insulating rubber (Joy Manufacturing Co. No. 319776), lapping well over the original insulation at each end of the wire splice. Cover with one layer of rubber tape to hold the insulating rubber in place as in view 3 of Figure B-l.

Step 9. Twist the splice slightly, group the conductors into shape, and bind together with a single layer of Joy Manufacturing Co. rubber tape. Slip the length of pipe along the cable until the spliced joint is positioned midway between the ends of the tube.

Step 10. Move the two Pyle-National Cord and Cable grips over the cable to the ends of the pipe and attach them to the pipe. Tighten the connectors securely such that the pipe becomes a watertight chamber containing the splice. The end fittings and grommet should grab the electrical cable such that the pipe will not slip with respect to the cable and that any tensile stress put on the cable will be transferred across the splice through the pipe and not the splice itself. Figure B-2 shows the completed splice.

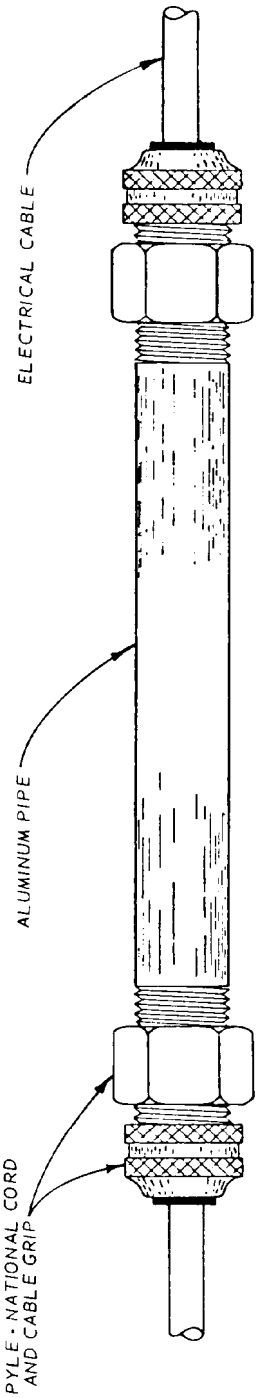

Figure B-2. Completed Aluminum Pipe Splice. (Prepared by WES)